

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

1. (currently amended) A plant comprising:

a feed gas separator

an absorber having first and second vapor ports fluidly coupled to the feed gas separator
that is configured to separately receive a first and a second portion of a feed gas
vapor, and having first and second liquid ports fluidly coupled to the feed gas
separator to separately receive a first and a second portion of a feed gas liquid, and
further having first and second overhead ports fluidly coupled to a downstream
distillation column to separately receive a first and a second portion of a downstream
distillation column overhead;

wherein ~~the absorber is configured such that~~ the first portion of the feed gas vapor and the
first portion of the distillation column overhead provide reflux to the absorber, and
~~wherein such that~~ the second portion of the distillation column overhead provides a
vapor stream enriched in ethane for ethane re-absorption at a bottom portion of the
absorber; and

a control unit that controls a ratio of the first and second portion of the feed gas vapor, the
first and second portion of the feed gas liquid, and the first and second portion of the
distillation column overhead as a function of a desired recovery rate of a feed gas
component in a bottom product of a distillation column.

2. (original) The plant of claim 1 wherein the distillation column is configured to operate as
at least one of a demethanizer and a deethanizer, and wherein the feed gas component in
the bottom product is ethane.
3. (currently amended) The plant of claim 1 wherein the ratio of the first and second
portions of the feed gas vapor, of the first and second portions of the feed gas liquid, and
of the first and second portions of the distillation column overhead determines absorber
overhead temperature.

4. (original) The plant of claim 1 wherein the absorber is configured to operate at an absorber pressure, wherein the distillation column is configured to operate at a distillation column pressure, and wherein the absorber pressure is greater than the distillation column pressure.
5. (original) The plant of claim 4 wherein an absorber bottom product is expanded to provide at least a portion of feed gas chilling.
6. (original) The plant of claim 1 wherein the second portion of the distillation column overhead is fed to the bottom of the absorber to thereby form a stripping gas stream.
7. (canceled)
8. (canceled)
9. (original) The plant of claim 2 wherein ethane recovery in the bottom product increases when the first portion of the feed gas vapor increases relative to the second portion of the feed gas vapor.
10. (original) The plant of claim 2 wherein ethane recovery in the bottom product increases when the first portion of the distillation column overhead decreases relative to the second portion of the distillation column overhead.
11. (currently amended) A method of operating a plant comprising:

providing an absorber and a downstream distillation column, wherein the absorber ~~receives a plurality of absorber feed streams and~~ provides a bottom product to the distillation column;

splitting a liquid portion of an absorber feed stream ~~at least one of the feed streams~~ into a first and second portion, and introducing the first and second portions of the liquid portion ~~at~~ different locations to the absorber;

feeding a first portion of a distillation column overhead to the absorber as a reflux and a second portion of the distillation column overhead as an ethane-enriched vapor stream to the absorber for ethane re-absorption at a bottom portion of the absorber;

using a flow ratio between the first and second portions of the distillation column overhead to control recovery of a desired product in a bottom product of the distillation column; and

splitting a vapor portion of the absorber feed stream ~~another one of the feed streams~~ into a first and second portion, and introducing the first and second portions of the vapor portion at different locations to the absorber, and using a flow ratio between the first and second portions of the liquid portion of the absorber feed stream, the distillation column overhead, and the vapor portion of the absorber feed stream feed streams, ~~respectively~~, to control recovery of the desired product in the bottom product of the distillation column.

12. (canceled)
13. (currently amended) The method of claim 11 wherein the absorber feed stream plurality of feed streams comprises a natural gas liquids vapor and natural gas liquids liquid.
14. (currently amended) The method of claim 11 [[13]] wherein the vapor portion of the absorber feed stream and the liquid portion of the absorber feed stream natural gas liquids vapor and natural gas liquids liquid are provided by a high-pressure separator.
15. (currently amended) The method of claim 11 [[13]] wherein the desired product in the bottom product of the distillation column is ethane.
16. (original) The method of claim 11 wherein the absorber is operated at a pressure that is higher than a pressure in the distillation column.
17. (currently amended) A method of operating a natural gas liquid plant, comprising:

providing an absorber that is fluidly coupled to a downstream distillation column, wherein the absorber receives a feed gas vapor, a feed gas liquid, and an overhead product from the distillation column; and

controlling flow of a vapor portion of the overhead product from the distillation column to the bottom of the absorber and flow of a liquid portion of the overhead product to the top of the absorber to control absorber overhead temperature such that ethane content in a bottom product of the distillation column increases when the absorber overhead temperature decreases.

18. (original) The method of claim 17 wherein the absorber is operated at a pressure that is higher than a pressure in the distillation column.
19. (currently amended) The method of claim 17 wherein [[the]] a portion of the feed gas vapor and the liquid portion of the overhead product are used as absorber reflux.
20. (currently amended) The method of claim 17 wherein ~~the portion of~~ the feed gas vapor, ~~the portion of~~ the feed gas liquid, and [[the]] a vapor portion of the overhead product are fed to the absorber.